

# Editorial

## Beyond Genomes and the Covid-19 Pandemic

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In this issue of *Folia Biologica*, Viza and colleagues suggest transfer factor as a potential option for managing the COVID-19 pandemic (Viza et al., 2020). Transfer factor, an activity identified in activated immune cells, which has modulatory effects on cell-mediated immunity, belongs to small regulatory proteins in a broader sense. These proteins have been found in many animal species, yet are mostly uncharacterized at the genomic level.

Big challenges in human societies often speed up discoveries that were in reach for a relatively long time but remained overlooked if social pressure and apparent need for new solutions were not imminent.

Deciphering multiple genomes fundamentally changed natural sciences, giving them new opportunities of insight into the mechanisms that enable life. Genomics and related sciences can connect observable phenomena with effector proteins, which can be traced to their genes. In the field of the host-infectious agent interaction, this translates to tracing the origin of effector proteins to the genomes of the hosts or infectious agents. This, if correctly employed, may lead to an explanation of the mechanisms and phenomena that are behind the data obtained by currently available methods or to their challenge, which may lead to discoveries that could not be anticipated otherwise. Indeed, there is a long list of discoveries that originated from the failure of controls to yield the expected negative results or from the observations that simply did not match the expected scenarios.

Transfer factor, identified as a dialyzable factor related to activated immune cells with effects on delayed hypersensitivity (the history of which has been summarized in Viza et al., 2013), may be such an effector protein or proteins. Despite the sound data that support the existence of transfer factors and availability of their protein sequences in some cases, the search in genomes using bioinformatic tools fails to confirm their existence both in the species that produced them and in the genomes of infectious agents in cases linked to infections.

Numerous possible causes may underlie this situation, including RNA editing, splicing occurring in the possible source RNA, and other mechanisms. In addition, small regulatory proteins do not necessarily act as single protein molecules and may perform their function as an integrated response to a spectrum of distinct proteins or their fragments.

The proposed possible involvement of transfer factor in the Covid-19 pathophysiology is surely a valid topic for a new direction in the Covid-19-centred research and a testable hypothesis with general importance.

The Covid-19 pandemic and similar viral infections indicate fundamental changes both in the development of human societies and in the critically flawed human behaviour towards the environment and towards other animals that share with us not only common space, but also evolutionary history.

The fact that large numbers of infected people seem to undergo the Covid-19 infection without symptoms or have very light progression of the disease while severe morbidity and mortality occurs in others points at the need to better understand the mechanisms underlying this and related infections.

Transfer factor is a well-suited target for focused research on Covid-19 (SARS-CoV-2) and similar infections, as suggested by Viza et al. (2020).

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### References

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